

REMARKS

By the Office Action mailed March 29, 2004, claims 1-20 are pending. Claims 19 and 20 are withdrawn from consideration. Claim 1-18 stand rejected. In response, Applicant amends the claims as described in detail below.

1. Restriction Requirement

The Office Action restricts the claims into two groups. Group I contains claims 1-18 which are drawn to a method for controlling the hypochlorite/hypochlorous acid balance of a fluid. Group II includes claims 19 and 20 and are drawn to a system for producing hypochlorous acid. Applicant provisionally elected Group I with traverse.

Applicant respectfully requests that the Group II be rejoined with Group I because the claims of Group II are directed towards a system for performing the method of claims 1-18 in Group I. The Office Action concludes that the claims of Groups I and II are drawn to distinct inventions because the apparatus of Group II can allegedly be used to practice another and materially different process, e.g. the production of carbon dioxide. Applicant respectfully disagrees.

Claims 19 and 20 are directed to a system that uses carbon dioxide to acidify a fluid ultimately containing a chlorination agent. The claimed apparatus cannot produce carbon dioxide. Indeed, as disclosed in the specification on page 8 and in Figure 2, the claimed system incorporates an acid injection system 200 which can inject carbon dioxide. Carbon dioxide is a reagent used in the system of claims 19 and 20 to practice the method of claims 1-18. The apparatus of claims 19 and 20 does not produce carbon dioxide. The method of claims 1-18 specifically describe adding carbon dioxide to a fluid containing a chlorination agent. Accordingly, Applicant submits that claims 19 and 20 are not drawn to distinct inventions because they cannot be used to practice a process that is materially different than the process of claims 1-18, and the claims of Group II should be rejoined with the claims of Group I.

2. Amendment to the Claims

Claims 1-4, 7, 9-13 are presently amended to clarify the claims. Generally, the claims are amended to clarify that the combination of the first mixed stream with the control stream containing a chlorination agent produces a third stream.

Claims 1 and 12 were also amended to include the steps of monitoring chlorine levels and pH of the third stream and adjusting the first mixed stream and the control stream to maintain a desired chlorine level and pH in the third stream. Basis for this amendment is found in the specification as originally filed, for example on page 8, lines 19-25 and page 9, lines 16-21. Applicant submits that no new matter is introduced by these amendments.

3. Claim Rejections under 35 U.S.C. § 112, second paragraph

Claims 2 and 9-11 are rejected as under 35 U.S.C. § 112, second paragraph as allegedly indefinite. Applicant has amended claims 2-3 to replace references to the control stream with references to the third stream. Claim 9 is amended to delete the parenthetical phrase. Claim 10 is amended to depend from claim 1. Claim 11 is amended to replace "system" with --method--.

In view of these amendments, Applicant submits the rejections of claims 2 and 9-11 are overcome.

4. Rejection of the Claims under 35 USC § 103(a)

Claims 1-3, 5-18 are rejected under 35 U.S.C. § 103 as obvious over Waggoner (US 6,019,905) in view of Shane (US 5,514,264). Claims 1-18 are rejected as obvious over Devine et al. (US 5,720,438) in view of Waggoner and Shane. Applicant respectfully traverses these rejections.

4.1 Relevant Law

The United States Patent and Trademark Office (USPTO) has the burden of showing a prima facie case of obviousness. *In re Bell*, 991 F.2d 781, 783 (Fed. Cir. 1993). In determining obviousness, the invention must be considered as a whole, and the claims must be considered in their entirety. *Medtronic, Inc. v. Cardiac Pacemakers, Inc.*, 721 F.2d 1563, 1567 (Fed. Cir. 1983). A prima facie case of obviousness is established when the teachings from the prior art itself would have suggested the claimed subject matter to a person of ordinary skill in the art. *In re Rhinehart*, 531 F.2d 1048, 1051 (CCPA 1976). More specifically, the requirements for establishing a prima facie case of obviousness include: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; (2) there must be a reasonable expectation of success; and (3) the prior art reference (or references when combined) must teach or suggest all the claim limitations.

When a rejection depends on a combination of prior art references, the USPTO must show that there is some teaching, suggestion, or motivation to combine the references. *In re Geiger*, 815 F.2d 686, 688 (Fed. Cir. 1987). The mere fact that the prior art could be modified would not have made the modification obvious unless the prior art suggested the desirability of the modification. *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991). Finally, obviousness may not be established using hindsight. *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1551 (Fed. Cir. 1983).

4.2 Rejection of claims 1-2 and 5-18

The Office Action rejected claims 1-2 and 5-18 as obvious over Waggoner in view of Shane because Waggoner allegedly teaches or suggests all of the elements of the pending claims except the step of injecting an acid into water at high pressure. Shane '264 is cited as curing this deficiency. Applicant respectfully disagrees. The purported combination of Waggoner and Shane fails to meet all of the limitations of independent claims 1 and 12.

Waggoner teaches a dental unit that incorporates an acid into a reservoir filled with water from a previously chlorinated water supply having a fixed chlorine level to reduce the pH of the water supply to a value of less than about 4. Stated another way, Waggoner simply teaches placing chlorinated tap water into a reservoir and adding a particular acid to reduce the pH of the water in the reservoir to a value of less than about 4.

Waggoner fails to teach or suggest a method for controlling the hypochlorite/hypochlorous acid balance of a fluid by acidifying a first carrier stream to form a first mixed stream; introducing a chlorination agent into a control stream, the chlorination agent increasing the concentration of hypochlorous acid and hypochlorite of the control stream; combining the first mixed stream with the control stream having the chlorination agent to form a third stream, thereby reducing the pH of the control stream having the chlorination agent and increasing the relative ratio of hypochlorous acid to hypochlorite of the third stream; monitoring chlorine levels and pH of the third stream; and adjusting the first mixed stream and the control stream to maintain a desired chlorine level and pH in the third stream.

In particular, Waggoner does not teach or suggest a method for controlling the balance of hypochlorous acid that includes the step of adding a chlorination agent to a control stream. Waggoner also fails to teach or suggest the step of monitoring the chlorination levels and pH of the stream produced by combining an acidified first mixed stream with a chlorinated control stream. Lastly, Waggoner fails to teach or suggest a method of controlling the hypochlorous acid balance of a fluid that includes the step of adjusting the acidified stream and the chlorinated stream to maintain a desired hypochlorous acid level in a third stream. Nor does Waggoner teach or suggest using carbon dioxide or carbonic acid to acidify a fluid stream.

Shane fails to cure the deficiencies in the teachings of Waggoner. For example, Shane fails to teach or suggest adding a chlorination agent to a control stream. Shane also fails to teach or suggest monitoring chlorine levels of a third stream and adjusting a first mixed stream and a chlorinated stream to maintain a desired level of hypochlorous acid in the third stream.

Because Shane fails to cure the deficiencies in the teachings of Waggoner, the combination of Waggoner with Shane fails to teach or suggest all of the elements of the pending independent claims 1 and 12, and similarly their dependent claims 2, 5-11 and 13-18. Accordingly, Applicant respectfully submits that the rejection has been overcome.

4.3 Rejection of claims 1-18

Claims 1-18 are rejected as obvious over Devine et al. (U.S. Patent No. 5,720,438) in view of Waggoner and Shane. The Office Action alleges that Devine et al. teaches all of the elements of the pending claims except (1) the step of introducing a chlorination agent in to the control stream and (2) the step of adding carbon dioxide or an acid to the water stream at high pressure. Applicant respectfully traverses this rejection.

Devine et al. teaches a mobile self-contained apparatus for processing and disinfecting infectious waste material. Waste materials are disinfected in a solution adjusted to contain 2,500 ppm hypochlorous acid. Devine et al. fails to teach how the disinfection solution is produced. More particularly, Devine et al. fails to teach a method of controlling the balance of hypochlorous acid in a fluid by, among other things, monitoring the chlorination levels and pH of the stream produced by combining an acidified first mixed stream with a chlorinated control stream. Devine et al. also fails to teach or suggest a method of controlling the hypochlorous acid balance of a fluid that includes the step of adjusting the acidified stream and the chlorinated

stream to maintain a desired hypochlorous acid level in a third stream. Nor does Devine et al. teach or suggest using carbon dioxide or carbonic acid to acidify a fluid stream.

As discussed above, Waggoner also fails to teach or suggest at least these steps of the claimed methods. Waggoner fails to teach or suggest adding a chlorination agent to a control stream; monitoring the chlorination levels and pH of the stream produced by combining an acidified first mixed stream with a chlorinated control stream; or adjusting the acidified stream and the chlorinated stream to maintain a desired hypochlorous acid level in a third stream.

Although Shane teaches the use of carbon dioxide to adjust the pH of a fluid, Shane fails to teach or suggest adding a chlorination agent to a control stream. Shane also fails to teach or suggest monitoring chlorine levels of a third stream and adjusting a first mixed stream and a chlorinated stream to maintain a desired level of hypochlorous acid in the third stream. Therefore, Applicant respectfully submits that the combination of the cited references does not result in the claimed subject matter, and the rejection is overcome.

CONCLUSION

In light of the foregoing amendments and for at least the reasons set forth above, Applicant respectfully submits that all objections and/or rejections have been traversed, rendered moot, and/or accommodated, and that the now pending claims 1-18 are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

Respectfully submitted,



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